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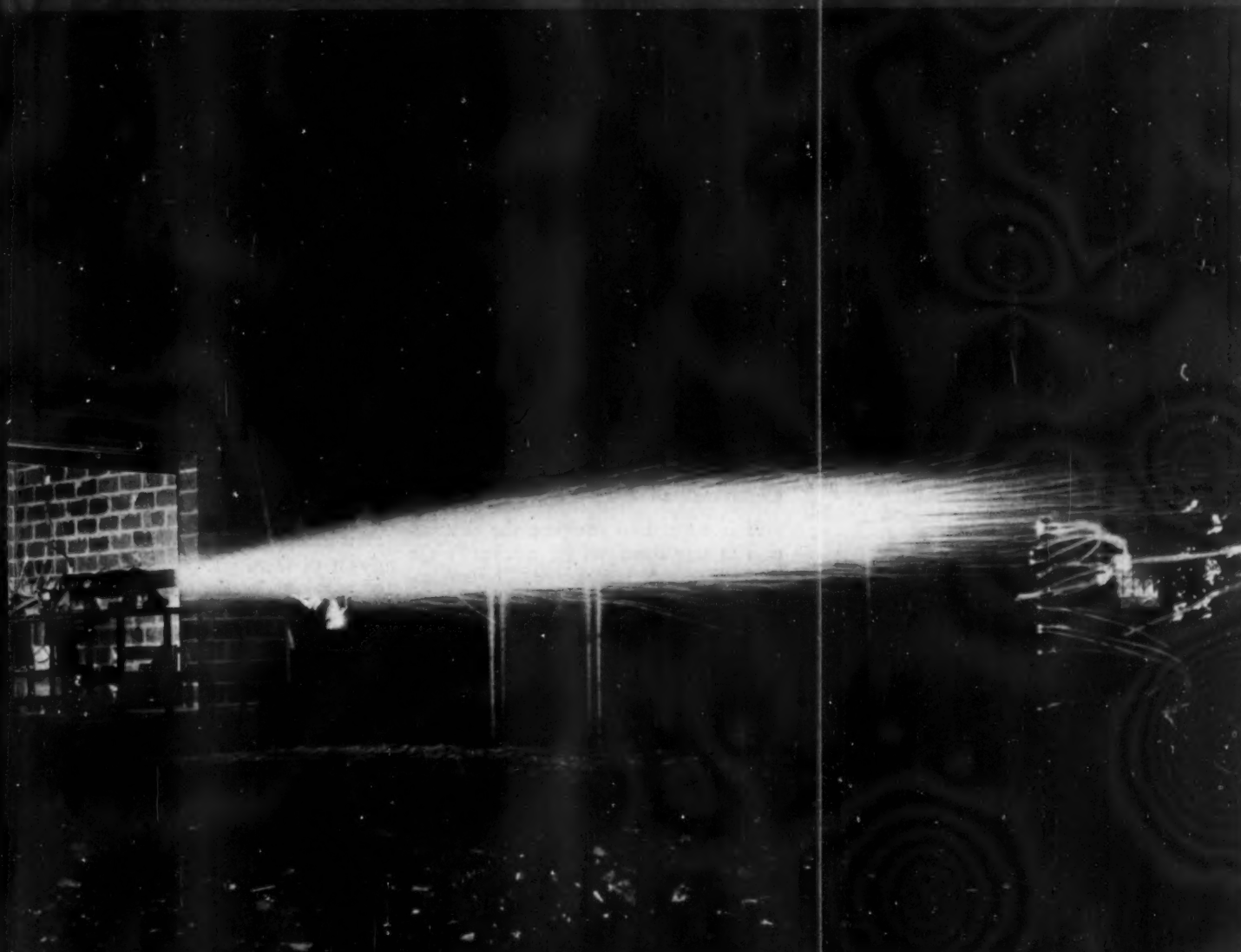
# SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • APRIL 26, 1947



Ram-Jet

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A SCIENCE SERVICE PUBLICATION

## CHEMISTRY

# Mysterious Explosive

**Ammonium nitrate, so harmless that it can be hammered, and so incombustible that it does not burn, can explode to burn city.**

► **CHEMICAL** mystery, unsolved after decades of investigation, is why ammonium nitrate explodes violently as it did in the ship at Texas City, yet won't explode when hammered or penetrated with high power rifle bullets.

The chemical villain in the Texas disaster is a harmless-looking white salt. It is not even classed as an explosive. It is usually safe to handle. A hundred million pounds are manufactured each year for fertilizer or explosives use.

Only infrequently does ammonium nitrate go off with great violence, as it did at Texas City and as it did at Oppau, Germany, in 1926.

As a leading explosive expert put it: "When ammonium nitrate explodes, it is always mysterious."

## Always Mysterious

Often slightly wet from moisture it has drawn from the air, the white crystals cake like table salt on a humid summer day. The caked masses often become so hard that workmen use iron picks and shovels to break them up. They pound the lumps with hammers. As a demonstration of the chemical's safety, they have even shot high-powered rifle bullets into a mass of the salt. Very special kinds of detonators are required to set off blasting powder made of ammonium nitrate, and no amount of shock is known to have caused the pure salt, uncontaminated with any other material, to explode.

Neither will ammonium nitrate burn. This is expected from chemical theory, for burning is, in general, combination with oxygen and the salt already contains a considerable quantity of that element. Even when heated to the ordinary degree in chemical processes it will take up no more.

It is another story, however, when the ammonium nitrate is contaminated with burnable material. Organic matter, chips of wood from packing boxes, fuel and lubricating oil dripping from carelessly closed containers, any of the combustible waste and dust constantly underfoot, mixed with the harmless-looking salt, make a mixture where conditions are just right for a fire.

Organic material is made largely of carbon, often combined with hydrogen into forms which need to be heated only slightly to catch fire and burn in the oxygen of the air. We are so used to the fact of fire that we seldom think of the dangerous flammability of common materials.

Ammonium nitrate is, in comparison with most materials, not flammable by combining with the oxygen of the air. But when mixed with material that is flammable it helps combustion by giving up its own oxygen to help the fire along.

Exactly what happens when ammonium is heated to a high temperature is still unknown, for when it "lets go" the whole mass explodes and there are seldom any survivors to report what happened. By violent rearrangement of the molecules, huge stores of energy are let loose in an instant. Flame and hot gases spread destruction to other burnable materials, and a holocaust like that in Texas City is the result.

## Compared to War

It is natural to compare the destruction to war damages, for essentially the same chemistry is involved. The ammonium nitrate which blew up the French ship *Grand Camp* was probably salvaged from war-time ammunition. For military use, the hazards of explosive material have been purposely increased. The energy-giving salt has been mixed with unstable chemicals to make explosives still more dangerous.

A question often asked is, "How does this explosion compare with that of the atom bomb?"

To the explosives chemist, who measures time in much shorter units than anyone else, the two types of explosion are very different. The huge vertical wall of blast pressure that moved out from Bikini was quite unlike the slower-moving wave set off by those types of ammonium nitrate explosives which have been thoroughly studied. Frequently used in coal mines for its effect in "heaving" rather than shattering coal, ammonium nitrate, making up as much as 95% of some blasting powder,

is considered slow and safe, as explosives go.

For the future, explosives experts feel that no additional regulations are necessary, so far as pure ammonium nitrate uncontaminated with organic material is concerned. Stock of ammunition being reworked for agricultural use must always present more hazard than the newly formed chemical which has never been mixed with explosive material. Care in handling the salt will always be needed because, as one chemist put it, "wood that has been soaked in ammonium nitrate burns very nicely."

*Science News Letter, April 26, 1947*

## BACTERIOLOGY

## Bacteria Corrode Concrete By Producing Sulfur-Acids

► **BACTERIA** that corrode solid concrete with sulfur-containing acids produced by their secretions have been discovered by Dr. C. D. Parker of the research laboratories of the Melbourne and Metropolitan Board of Works, Australia. He has named the new species *Thiobacillus concretivorus*, which translates as "sulfur-bacillus that eats concrete." It makes a good deal of trouble in concrete sewer pipes.

Actually, the bacteria do not literally eat the concrete; they feed on the complex mixture of decaying materials in the sewage, as do many other kinds of microorganisms. Sewage contains proteins and related compounds; breakdown of these yields sulfur compounds of varying degrees of complexity. It is on these sulfur compounds that some of the bacteria feed, for which reason they have appropriately been named thiobacteria or sulfur-bacteria.

One thing puzzled Dr. Parker at first: his concrete-eaters require a rather highly acid medium in which to live, and the surface of fresh concrete is quite definitely alkaline. He discovered upon further investigation that the way was prepared by other bacteria, operating in two stages. First came a group of mixed bacteria that could tolerate the concrete's alkalinity, then one already-known species, *Thiobacillus thioparus*, which could tolerate some alkalinity and also live under increasingly acid conditions. Finally, the newfound concrete-eaters took over at a higher degree of acidity, increasing it to a point where the acids are able to corrode the concrete.

Dr. Parker has reported his discovery to *Nature* (March 29).

*Science News Letter, April 26, 1947*

## MEDICINE

# Penicillin Prevents Syphilis

**Mold chemical acts as a prophylactic agent against germs before the disease develops when injected in rabbits. More research is necessary before success is sure.**

► **PENICILLIN** may be the long-sought "magic bullet" which not only cures syphilis but prevents the disease. It works in rabbits and probably will work in man.

Discovery that penicillin may become a prophylactic against syphilis was made by Drs. Harry Eagle, Harold J. Magnuson and Ralph Fleischman of the U. S. Public Health Service, the Johns Hopkins School of Hygiene and the University of North Carolina.

One or two tiny doses of the yellow mold chemical, injected within a few days after exposure to syphilis, would prevent the disease from developing if humans respond as the rabbits in Dr. Eagle's laboratory at Johns Hopkins have.

## Germs Checked

The germs of syphilis, called spirochetes, are stopped by the penicillin after they have invaded the body but before even the first sore of the disease has developed.

Whether penicillin will prevent syphilis from developing in people who become infected with its germs will not be known for at least two years. Doctors could have the answer in three or four months if it were not for the prudish, hush-hush attitude many people still have about this disease which attacks a quarter of a million Americans every year.

To get the answer quickly, it would be necessary to shoot living syphilis germs into human bodies, as they were injected into the rabbits. Then half the human rabbits would be given penicillin. The other half would not. If none of the first group got syphilis, and most of the second group did, it would prove that the penicillin prophylactic treatment had been successful. Those who got syphilis could later be cured by regular eight-day penicillin treatment now used for syphilis.

Stopped by prudery from making this quick, critical test, Dr. Eagle is already planning for the two- to three-year test. This will be made by trying to reach contacts of syphilis patients who come

to the clinic. The contacts wanted are the men and women, boys and girls who were exposed to the disease by the patients, not the ones from whom the patients got the disease. These contacts who probably have caught the germs but have not yet developed the disease will be given the prophylactic doses of penicillin. But it will take a long time to find and treat enough of them so that the results will be conclusive.

## Many Needed

It will be necessary for large numbers because, for one thing, not every contact would necessarily get syphilis. There is no way of knowing which ones would get the disease until the first sore appears. The most sensitive tests for syphilis now available do not give positive results until a week or 10 days after the primary sore appears. The time between the invasion of the germs and the development of the disease, called the incubation period, is 21 days. This period has been set from histories of

cases in which the doctors were able to learn the date of exposure and germ invasion and the date of the first symptoms.

Studying the effects of various doses of penicillin given to rabbits during this incubation period led to the discovery of the prophylactic action of the mold chemical. The rabbits were given a definite number of syphilis spirochetes. Then different-sized doses of penicillin were given at different times after the germs. From these studies Dr. Eagle and associates found that the amount of penicillin needed to cure syphilis is related to the number of organisms invading the body and the time after the invasion the penicillin is given. The greater the number of organisms, the more penicillin is needed. Details of these studies are reported in the *Journal of Experimental Medicine* and were discussed at the conference on venereal diseases held at U. S. Public Health Service headquarters in Washington.

A military application of the discovery, if human trials prove successful, is one scientists are already speculating on. Soldiers likely to be exposed to syphilis could be given prophylactic doses of penicillin as they returned from leaves, as they were given sulfathiazole to check gonorrhea on returns from leaves during the war.

*Science News Letter, April 26, 1947*



**PENGUINS ON ICE**—Formally dressed and curiously staring, these birds are making tracks on Pack Ice in Antarctica.



## AERONAUTICAL ENGINEERING

# Ram-Jet For More Speed

A new engine so light that one man can lift it is predicted to make planes beat the sun as they cross the horizon. Ram-jet is of simple construction.

## See Front Cover

► A RAM-JET airplane that will beat the sun by traveling double the speed of sound, taking only 15 minutes to go from New York to Pittsburgh, was predicted by Dr. F. W. Schumacher, associate director of Esso Laboratories.

The pilot would be able to see the sun set in New York, rise over the horizon and then set again in Pittsburgh.

Flying in the stratosphere, the ram-jet motor will require only a tenth of the fuel needed just above sea-level. This aircraft propulsion unit was proved practical by the Navy's Bumblebee supersonic anti-aircraft weapon designed to counter Japanese suicide planes.

Much simpler in construction than conventional reciprocating engines, the ram-jet in its 1,400 miles per hour form develops one horsepower for each half ounce in weight compared with about a pound for ordinary engines. A ram-jet developing 2,000 horsepower will be so light that one man can lift it.

Flame shoots from ram-jet shown on the cover of this SCIENCE NEWS LETTER. About six inches in diameter, one jet releases heat equivalent to that of 300 domestic oil burners.

New fuels are being research-made for ram-jet use, and military develop-

ments underway promise superspeedy mail, express and passenger transport for the future.

Refrigerated as well as pressurized cabins will be needed. Without cooling, passengers would be heated to 300 degrees Fahrenheit at 1,400 miles per hour speeds, while the thermometer would rise to 650 degrees at 2,000 miles per hour.

Before ram-jet power plants are used, there will be commercial use of a combination of propeller and jet propulsion powered by gas turbine engines.

Three to ten years or longer will be needed to apply turbine power to commercial flying, depending upon the amount of research expended, in the opinion of Dr. Philetus H. Holt, Esso's assistant research director. Gas turbine and jet are combined now on the famous P-80 fighter planes.

Long flights of 3,000 miles will take six to seven hours instead of 12 to 14 hours as at present, Dr. Holt predicted.

Fuels of the future are being developed at the Standard Oil Company laboratories in Bayway, N. J., shown recently for the first time since the war. With airplane flying at great stratosphere heights, fuels must have a low freezing point to keep flowing at the intense cold there.

*Science News Letter, April 26, 1947*

it from them.

Three victims have died of smallpox, and New York's all-out war on the disease which can be prevented will be an expensive fight.

Smallpox can be prevented by correctly done vaccination. Yet there are many persons in the United States who have never been vaccinated, and many more unvaccinated in other countries, even though doctors and health authorities the world over know that vaccination protects against smallpox. The protection does not always last a lifetime, so authorities advise revaccination after five years, particularly for those likely to be exposed to the disease.

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## MEDICINE

# Preventing Smallpox

► ONE case of smallpox in New York is costing approximately \$1,000,000.

Chief items on this huge medical bill are the vaccinations for about half a million persons and the health detection work necessary in tracking down persons who might have caught the disease from the first case and be spreading the germs further.

Mayor William O'Dwyer of New York City estimates the cost of an emergency program of free vaccinations at \$100,000. But the mayor has urged that all the millions of residents of the city be vaccinated. Health authorities believe

thousands will be vaccinated by their own physicians and the total cost of the campaign will be nearer \$1,000,000.

This money is being spent to protect New York residents and millions of other people throughout the nation. But in one sense, it is a waste of money, because smallpox is a preventable disease.

The million-dollar case was brought into the city from outside the country. Many persons were exposed to the germs before it was known that the first patient had smallpox. Some of them caught the disease and others may have caught

## CHEMISTRY

# Bomb Products Are Known

Chemists have determined what the products of the fission of an atomic bomb are. Element 61 is yet to be named. Other research is reported.

*Highlights of the annual American Chemical Society meeting, held last week in Atlantic City, N. J., are presented in this issue.*

➤ **JUST WHAT** happens when an atomic bomb fissions and what chemical elements are formed in the big smash-up or uranium 235 atoms are now known.

The American Chemical Society meeting in Atlantic City, N. J., was told by Dr. Aristid V. Grosse, now of the Houdry Process Corp., that 34 different elements have been detected among the fission products of the kind of uranium that can be made into a bomb.

Four elements, neodymium, barium, zirconium and molybdenum, account for nearly half of the weight of the uranium split asunder with great release of atomic energy. More than 10% of the weight reappears after the fission in each of these elements.

Two elements that do not occur naturally, because they are radioactive and thus destroy themselves, are produced in substantial amounts in uranium fission. These are element 43, recently named technetium, and element 61, as yet unnamed.

For each hundred pounds of uranium 235 fissioned, 2.6 pounds of technetium and 4 pounds of element 61 are produced.

This means that at Bikini, where two bombs were exploded, several pounds of each of these hitherto non-existent elements were manufactured and let loose in the world.

The chemists determined the amounts of elements formed by measuring the results of controlled fission or production of atomic energy in the large structure, called an atomic pile, in which slowly moving neutrons (electrically neutral atomic particles) cause the splitting of the uranium atoms in a controlled manner. The results should, however, apply in essential features to fast neutron fission such as occurs in the atomic bomb, whether it is made of uranium or plutonium.

*Science News Letter, April 26, 1947*

## Element 61 Naming Delayed

Christening of element 61 was expected to take place at this meeting but has been delayed probably until the fall meeting of the American Chemical Society. The discoverers of the element,

who worked together on the Manhattan atomic bomb project, are not yet ready to decide on the name since some of the information they wished to announce at the same time is still being kept secret.

*Science News Letter, April 26, 1947*

## Radioactive Chlorine

Chlorine, one of the elements in common salt, can be made so radioactive by exposure to neutrons in the atomic pile that one radioactive form of it will keep on giving off radiation for more than a million years. Dr. Ralph T. Overman, of the Monsanto-operated Clinton Laboratories at Oak Ridge, Tenn., reported on four activities produced by very long neutron irradiations of various chlorine compounds in the Clinton Laboratories chain-reacting pile.

Since Bikini bombs bombarded the salty sea water with neutrons, this means that some of the radioactive chlorine produced has a half-life of a million years and the effects of the Bikini bombings will be felt in this way for longer than a million years.

*Science News Letter, April 26, 1947*

## Steel Wastes Combined

Once in a while marriage of a pair of wastrels results in the reform of both of them. Something of this sort may be realized in the chemical world by the combination of two troublesome waste-products of the steel industry, coke oven ammonia and spent pickle liquor, proposed by Dr. Richard D. Hoak of the Mellon Institute of Industrial Research, Pittsburgh.

Pickle liquor is a sulfuric acid solution used to remove oxide scale from new steel. At the end, it still contains some uncombined acid, together with a quantity of mixed iron compounds. Dr. Hoak's suggestion is to run the ammonia into the spent pickle liquor, producing ammonium sulfate, which is valuable in both agriculture and industry. The iron residues he would put back into the blast furnace, for re-extraction.

*Science News Letter, April 26, 1947*

## Oleomargarine Good Food

The perennial dispute over oleomargarine came in for another round of discussion in a paper by Dr. Paul Gyorgy of the University of Pennsylvania school of medicine. He pointed out that in feeding experiments laboratory rats thrive just as well on skim milk



**NAVY TRANSPORT**—This helicopter, recently unveiled by the Navy, was designed during the war for rescue work. It can travel 100 miles an hour and carry a crew of two plus eight passengers.



with added soybean oil as they did when the supplementary fat was butter.

"In the light of these and similar observations," he declared, "generalized

discrimination against vegetable fats, including margarine and 'filled' milks, does not appear to be justified."

*Science News Letter, April 26, 1947*

#### CHEMISTRY

## Usefulness of Adsorption

► ADSORPTION, the less-known physical twin of absorption, may become a more familiar word in everyday English because it is finding an increasingly important role in chemical industry. At the meeting of the American Chemical Society in Atlantic City recently, Drs. Alfred E. Hirschler and Senta Amon of the Sun Oil Company told how adsorption is used in purifying high-grade petroleum products.

As everyone knows, a liquid is absorbed into a porous object, like a sponge or a blotter, by being drawn into its fine cracks and fissures. A liquid or a gas is adsorbed, not into a solid, but simply onto it. Its molecules cling to those of the solid surface with an almost unbreakable attraction; it is the "stickin'-est way of sticking". The adsorptive force can be broken by various means; one of the simplest is by heating.

In purifying high-grade hydrocarbons, the mixture containing them is contacted with a finely divided substance that presents a maximum amount of surface per cubic inch, like carbon or silica gel. Certain kinds of molecules are adsorbed; others are not, and can be drawn off. Then the adsorbed molecules can be freed, without so many strangers in their company.

*Science News Letter, April 26, 1947*

## Calcium Carbonate in Paint

Girls singing the old opera favorite, "I dreamt that I dwelt in marble halls," may now mean nothing more than that the rooms of their family dwelling-places have been properly painted. For the chemical substance that in polished slabs is marble, calcium carbonate, is useful in microscopically divided form as a paint extender, Dr. H. W. Siesholtz of the Witco Chemical Company, told the meeting.

Instead of grinding up marble or limestone to get for this purpose, calcium carbonate is made by chemical precipitation. This makes the particles exceedingly small—a hundred-thousandth of an inch or less. The smaller

the particles the better they will spread in paint, and the better they will reflect light from the finished surface.

*Science News Letter, April 26, 1947*

#### CHEMISTRY

## More Sulfur Grows Bacteria To "De-Smell" River Water

► SO MANY rubber manufacturing plants were dumping their wastes into the Ohio river during the war that it created a serious problem for cities down-stream that had to take their drinking water out of it. Plainly stated, it stank, and indignant citizens demanded that something be done about it. What Dr. Herbert Fleischmann, of the Covington, Ky., filtration plant did was dump powdered sulfur into the storage basins. This encouraged the growth of bacteria that feed on sulfur, and while they ate up his gifts of free sulfur they also devoured the smelly, sulfur-containing wastes that were making the trouble.

*Science News Letter, April 26, 1947*

#### CHEMISTRY

## Too Little Soap Means Work in Washing Clothes

► TOO LITTLE soap used in the laundry means more work in getting the clothes clean, Osborne C. Bacon and J. Edward Smith, of the E. I. du Pont de Nemours & Co., told the meeting of the American Chemical Society in Atlantic City, N. J.

Using a miniature washing machine that measures the soap and the amount of power used, the scientists found that up to a certain point higher concentration of the soap lessened the time and force needed to wash the clothes satisfactorily.

Cutting the concentration of soap in half doubles the amount of work needed to get the same result. For a 20-minute washing period, if only half the proper amount of detergent is used, twice as much work is required to remove the same amount of soil.

"Soap does not remove dirt in a washing machine," Mr. Bacon stated. "It is the work, not the soap, which actually removes the dirt. The soap has done all its cleaning work before the machine starts, for the soap loosens the dirt and the mechanical action of the washer takes the dirt off, then the soap prevents the dirt from going back onto the cloth. This action of soap makes the clothes white. Where there is insufficient soap in suspension for this preventive action, the clothes usually turn out gray."

"Mechanical action and soap are independent. They do their work alone, not together, although both are needed for clean clothes." Beyond a certain concentration, the addition of more soap does not remove any more dirt, or speed up the cleansing operation."

*Science News Letter, April 26, 1947*

#### FOOD CHEMISTRY

## Mild Cooking Improves Chicks' Soy Bean Food

► YOUNG CHICKENS and turkeys may come to market sooner as the result of being fed soy beans, agricultural and food chemists learned at the opening session of the American Chemical Society meeting in Atlantic City, N. J.

Mild cooking improves soy beans as food for young chickens, Dr. Robert John Evans of the division of chemistry and Dr. James McGinnis of the division of poultry husbandry, both of the Washington Agricultural Experiment Station, Pullman, Wash., reported. However, longer cooking under greater pressure makes the soy preparation less valuable as a source of protein for the growing chicks.

The chemists added known proteins to the feed of the chicks getting the overcooked meal, until they learned which ones gave as good growth diets as the soy meal that had had less cooking. They also digested the feeds in test-tubes. From these tests they learned that long pressure cooking destroys 30% of the lysine in the soy preparation, and 40% of the cystine, but leaves the methionine unharmed. All three are necessary for good growth of the poultry.

Further data to show that short cooking and low pressure is the best method for preparing soy bean diets comes from Drs. J. C. Fritz, E. H. Kramke and C. A. Reed of the Borden Co., whose tests with young turkeys show that more methionine makes them grow faster.

*Science News Letter, April 26, 1947*

## CHEMISTRY

## Man and Rat Are Proved To Be Vitamin Factories

► A MAN and a rat can do something that microorganisms cannot, except in one case. A microscopic creature named *Acetobacter suboxydans* is the sole member of his kind to be able to turn pantothenyl alcohol into the B-complex vitamin pantothenic acid.

But man and his experimental opposite number, the laboratory rat, can do it with ease, according to Dr. Saul H. Rubin, director of the nutrition laboratories of Hoffman-LaRoche, Nutley, N. J. He reported his joint researches with Dr. J. M. Cooperman, Miss M. E. Moore, L. Dreker and J. Scheiner, before the American Chemical Society's division of agricultural and food chemistry.

Dr. Rubin stated that pantothenyl alcohol, which is more stable and satisfactory than the acid to use in pharmaceutical preparations, is changed in the body of a mammal to the acid form which the body needs, with full vitamin activity. This allows the pharmaceutical manufacturer to put the vitamin-forming alcohol into his preparation, where it will stay unchanged until the patient swallows it and makes his own pantothenic acid out of it on the spot in the place where it is needed.

*Science News Letter, April 26, 1947*

## BACTERIOLOGY

## Virus Murders Germ By Stealing Phosphorus

► THE CHEMISTRY of death in a bacterium attacked by a much smaller virus particle was described to the American Chemical Society meeting in Atlantic City, N. J., by Dr. Seymour S. Cohen of the University of Pennsylvania school of medicine. Essentially, it is a theft of phosphorus.

The virus particle, which is tadpole-shaped, has in its make-up a phosphorus-containing compound, nucleic acid. The bacterium has two kinds of nucleic acid, different from the one in the virus, as well as other phosphorus-containing substances. In a virus-infected microbe, the processes by which it normally made use of phosphorus it obtained from its environment were all shunted to the production of the kind of nucleic acid the virus wanted. The bacterium could not grow, and eventually died.

This might all be very comforting to

observe in a germ; but Dr. Cohen reminded his hearers that essentially the same process happens to our own cells when they are invaded by the viruses of such diseases as smallpox, yellow fever and poliomyelitis.

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## CHEMISTRY

## Germ-Killer in Garlic Produced Synthetically

► A PENICILLIN-LIKE germ-killing substance known to be present in garlic can now be produced synthetically, Dr. L. D. Small of the Sterling-Winthrop Research Institute announced at the meeting in Atlantic City, N. J., of the American Chemical Society. Several entirely new compounds chemically related to it have also been made; these control disease germs that resist other antibiotic drugs.

*Science News Letter, April 26, 1947*

## PHYSICS

## Whirling in Simple Tube Separates Hot and Cold Air

► HOT AIR from one end and cold air from the other come from a 15-inch-long tube into which compressed air is fed. There is no special heating or cooling equipment.

It is an improved piece of laboratory apparatus, developed by a Westinghouse

scientist from a German invention. The device achieves a long-cherished dream of scientists: to separate the elements of heat and cold that are present in every gas. It may never be applicable commercially in the refrigeration or heating field, but it has definite applications in the science laboratory.

In the device, compressed air enters into a nozzle at the right end of the tube where it strikes a steel spiral that converts it into a whirlpool of rapidly spinning gases. The air in the center of the whirlpool becomes cold almost instantly, while that toward the outside becomes hot. The cold air is drawn off through a small opening at the right end of the tube, and the warm air through a similar opening at the other end. The device has no moving parts, and is inexpensive to construct.

The German inventor, R. Hilsch, claims that in his device he produced one jet of air as hot as 154 degrees Fahrenheit and another as cold as 10 degrees Fahrenheit. He predicted a possibility of obtaining air at over 400 degrees hot and also air whose temperature would be 50 degrees below zero. The instrument, made by Gaylord W. Penney, does not deliver air of widely separated temperatures, but the tube is of large diameter so that measuring instruments can be placed inside to study what is happening in the whirlpool.

*Science News Letter, April 26, 1947*



**HOT-COLD PIPE**—This tube separates hot and cold air. Compressed air is whirled by a steel spiral to make the difference in temperature.



## MEDICINE

**Food Allergies Cause Skin To Break Out with Eczema**

► **FOOD ALLERGY** appears to be the cause of most cases of eczema of the hands.

This is indicated in a new study by Dr. Albert H. Rowe, University of California Medical School.

In 80 cases of eczema of the hands, Dr. Rowe cleared up the condition by removing the guilty foods from the patient's diet. To prove his point he had the patient eat these same foods again. A new outbreak of eczema followed.

This does not eliminate other causes of eczema, such as inhalation of pollen and dust or the irritants contacted in various occupations, but it places a new importance on the role of food allergy.

The physician's treatment, consisting of a diet eliminating the allergenic foods but protecting nutrition and weight, usually began to show results in about two weeks, the period in which the guilty foods are eliminated from the body.

The skin usually became normal. Redness, itching and scaling remained in some cases, usually because of breaks in the diet, impossibility of eliminating all allergenic foods, or secondary reactions produced by soap, water, heat, sun, wind or chemicals.

Irritations of the skin of the hands, such as contact with industrial irritants or household chores, including cooking and washing, were found by the physician in some cases to trigger the food allergy into eczema.

This is illustrated by the fact that 80% of Dr. Rowe's food-sensitive patients were women. Most housewives were able to resume their chores without ill effect after the primary cause of the condition had been removed, however.

*Science News Letter, April 26, 1947*

## MEDICINE

**Smallpox Vaccine at Peak With Year's Supply Ready**

► **RIGHT NOW** is the time of year when the nation's supply of smallpox vaccine is at its peak, with practically a year's supply on hand. So you can get vaccinated, and probably should, even though health authorities do not expect any epidemic to follow the 13 cases and three deaths that occurred in New York City and environs.

The shortage which slowed New York

City's vaccination program and may slow similar programs in other cities is due, apparently, to a run in the tubed vaccine. This is the form in which it is dispensed for use. Each almost needle-thin glass capillary tube contains one dose of vaccine. Ordinarily manufacturers might have half a million tubes ready to dispense, with the rest of their vaccine supply on hand in the "pulped" form.

Vaccine manufacturers ordinarily bring production to a halt at this season because the virus from which it is made does better in the cool weather.

It takes a month or six weeks to produce a batch of vaccine, starting from scratch with the calves.

*Science News Letter, April 26, 1947*

## CHEMISTRY

**Porous, Granular Compounds Can Carry Soil Fumigants**

► **EXPLODED MICA**, coarse sawdust and other granular, porous substances are used as carriers for soil fumigants like the chlorides of ethylene, propylene, etc., which have been found effective for the control of borers and other soil-dwelling pests. This invention, protected by patent 2,419,073, is the work of O. H. Hammer of South Haven, Mich., assignor to the Dow Chemical Company.

*Science News Letter, April 26, 1947*

## PHYSICS

**Quiet Typewriter Platen Made of Separate Disks**

► **A FRESH APPROACH** to the problem of reducing typewriter noise is represented in the invention on which U. S. patent 2,418,698 has been issued to Frederick U. Conard of West Hartford, Conn. Instead of attempting to minimize the blow of type against a solid platen, as in present-day "noiseless" typewriters, this invention undertakes to provide a platen that will not make so much noise when struck.

This is accomplished by building it up of a series of separate pierced disks or washers, each just one type-space wide, strung on a cylindrical rubber cushion supported by the central steel rod. As the typebars strike, each disk yields slightly; also very little of its vibration is transmitted to its neighbors, so that the platen as a whole does not resound. Rights in the patent are assigned to the Underwood Corporation.

*Science News Letter, April 26, 1947*

**IN SCIENCE**

## ENGINEERING

**Infra-Red Studies Make Home Refrigerators Better**

► **STUDIES** with the infra-red spectrometer, which help to produce a drier refrigerating fluid, are expected to bring the market an electrical refrigerator that will not need servicing more than once in 10 years, it was predicted in a paper by Drs. A. F. Benning, A. A. Ebert and C. F. Irwin of E. I. du Pont de Nemours and Company at the American Chemical Society meeting in Atlantic City, N. J.

If as little as ten parts per million of water gets into the freon used in refrigerators, it is likely to cause trouble. Analytical methods necessary to detect so little water have hitherto been extremely tedious, the standard procedure requiring four hours to complete. By the infra-red spectrometric method the water content of freon can be determined accurately in five minutes.

*Science News Letter, April 26, 1947*

## CHEMISTRY

**Chemists Getting Close To Synthetic Antibiotic**

► **WHENEVER** a new natural product of plant or animal origin is discovered, chemists straightway undertake to make something like it—or better it. They have been trying to do this with penicillin, and at the meeting of the American Chemical Society in Atlantic City, N. J., Dr. Merritt C. Fernald and Dr. Walter B. Geiger of the New Jersey Agricultural Experiment Station announced that they are approaching the goal.

They have prepared a number of synthetic compounds that have much the same effects on bacteria and fungi as the natural antibiotics. The most powerful thus far investigated is known as acrylophenone. It has two drawbacks, however: it is only slightly soluble in water and is closely related to another compound that is highly poisonous to animals. So they are going on with their search for synthetic germ-killers that are safer to use.

*Science News Letter, April 26, 1947*



# NEW FIELDS

## NUTRITION

### Jet-Tenderizer Cures and Softens Tough Beefsteaks

► BEEFSTEAKS and other meats that are a trifle tough won't have to be brutally mauled with pounders or mechanically chewed up by one of the newer electrically-driven devices if a new jet-tenderizing process invented by V. L. Tichy of Cleveland comes into general use. Also, it will be possible to use meat immediately after slaughtering, without the time-consuming processes of "hanging" or curing now necessary.

Mr. Tichy's process takes advantage of the long-known fact that a needle-fine jet or spray of liquid at very high pressure will penetrate flesh to a considerable depth. Workers around diesel engines are thus injured, sometimes, when a small leak develops in the high-pressure oil injector.

Exactly the same principle is used in the jet-tenderizing process. Spray-openings as small as a ten-thousandth of an inch in diameter, with pressures as high as seven thousand pounds per square inch behind them, are used to drive droplets of tenderizing fluids into the meat. The fluids may be liquid fats, fiber-softening enzyme, mild acids or anything else that will accomplish the purpose. Small solid particles may also be shot through the jets, in liquid suspension. Meat can thus be salted and peppered in advance, if desired.

U. S. patent 2,418,914 has been granted on this invention.

*Science News Letter, April 26, 1947*

## METEOROLOGY

### Facsimile Weather Maps To Be Used by AAF Pilots

► FACSIMILE transmitters for relaying weather maps to Army Air Force pilots by wire or radio are being installed nationwide, it has been revealed. The system will furnish even the smallest equipped airports with up-to-the-minute weather information.

The transmission of pictures, maps and printed pages by wire or radio is not new, but recent developments have made it more practical than ever before. Facsimile transmission is now coming into

wide use. Newspaper offices are planning to use special broadcasting stations to deliver important news direct to homes at regular intervals, one letter-sized page at a time.

In facsimile transmission, the picture or page to be sent is put on a cylinder and rapidly scanned by a revolving sharp beam of light that passes over it in parallel lines. The beam is then passed to an electric eye, its intensity varied by lights and shades on the picture. The electric current from the eye therefore varies. The receiver in the office or home works in reverse. A beam from a light source in it varies in intensity with the current received. This beam of light travels in rapid lines over a photographically sensitized paper, leaving an exact copy of the picture being sent.

The Army plans call for dividing the entire United States into four large networks, each covering approximately 1,000 square miles. Weather analysts in a centrally located weather bureau will prepare the maps, insert them into the transmitters, and relay copies to stations all over the nation. Pilots taking off from any field in the country equipped with facsimile receivers will have the advantage of the latest weather information.

*Science News Letter, April 26, 1947*

## MEDICINE

### Penicillin Helps to Cure Germ Infections of Bones

► PENICILLIN is helping the lame to walk again, at least if their trouble has been due to chronic germ infections of the bones.

A patient who for a long time had chronic tuberculosis of the knee joint and osteomyelitis of the thigh bone and the inner bone of the leg below the knee had excellent function of the leg at the end of a year, thanks to penicillin and surgical operations.

This and 57 other cases in which penicillin was used with surgery to clear up bone infections are reported by Drs. H. J. McCorkle, Henry Silvani and W. E. Stern and Miss Helen Warner, researcher, of the University of California Medical School.

The penicillin is given several days before operation. Then the surgeons remove all infected bone tissues and penicillin is again given, this time until the soft tissues and bone are healed. Details of the treatment appear in *Surgery, Gynecology and Obstetrics* (March).

*Science News Letter, April 26, 1947*

## ENGINEERING

### Electric Power from Nile To Help Egypt's Industry

► UPPER EGYPT is promised plenty of electric power from the Assouan dam on the Nile. Funds for the electrification of the giant dam have now been authorized, it is revealed. Development of some 270,000 horsepower is expected.

One important use planned for the electricity is the fixation of nitrogen, to supply Egypt with badly needed fertilizer. The power will also be used to develop the iron and other mining industries, as well as for lighting cities, pumping irrigation water and operating railways.

Assouan dam, completed in 1933, is located at the first cataract of the Nile, 750 miles south of the Mediterranean. Its electrification is a war-delayed project. An official study of its possibilities was begun in 1939. It provides an 85-foot head of water, and is said to store over 5,000,000,000 tons of water. Its reservoir backs up the water 180 miles, to near the second cataract of the Nile.

Construction of the earliest Assouan dam was completed in 1902. This original has been heightened twice to make the present structure. Its construction was strongly opposed by archaeologists, because the reservoir when filled covers all but the highest portions of the Temple of Philae. The temple, strengthened before the building of the dam was started, is now partially disclosed at low water.

*Science News Letter, April 26, 1947*

## OPHTHALMOLOGY

### Blindness in Babies Reduced by Over 75%

► BLINDNESS in new-born babies, resulting from a germ disease, has been reduced by more than 75% since 1908, when the National Society for the Prevention of Blindness started its fight against this form of blindness.

Public education and legislation are credited with this achievement in the annual report by the society's president, Mason H. Bigelow.

The increase in life expectancy has increased the amount of eye disease and the machine age has brought further hazards to eyesight through industrial accidents. Efforts to combat these dangers to vision are now being made by the Society.

*Science News Letter, April 26, 1947*

## ASTRONOMY

# Jupiter Is Closest in May

Except the moon, Jupiter is the brightest object in the May sky. May will bring a solar eclipse, most important astronomical event of the year.

By JAMES STOKLEY

► AS IF to call attention to the reappearance in the evening skies of a characteristic constellation of summer, one of the brightest planets is now visible nearby. Look to the southwest on May evenings and the most conspicuous object (except the moon) that can be seen is Jupiter. Standing in the constellation of Libra, the scales, its place is shown on the accompanying maps, depicting the skies at 10:00 p.m., your own kind of standard time (or 11:00 p.m. daylight saving time) on the first of the month; an hour earlier about May 15, and two hours earlier on the 31st. Just below Jupiter, Scorpius, the scorpion, is beginning to appear, with Antares, red in color, just getting above the horizon. Later in the evening than the times given it rises higher and the rest of the scorpion is in view.

## Jupiter Opposite Sun

On the 14th of May Jupiter is in opposition—that is, it is directly opposite the sun, which means that it rises at sunset and is in the sky all night. Also, it means that the planet is closest to the earth (only 407,300,000 miles) which is responsible for its being so bright. Incidentally, on May 5 the moon, a day after it is full, passes very close to Jupiter, just to the south. They are closest at 7:09 p.m. EST, which will be before it gets dark over most of the country.

Another planet can also be seen. This is Saturn, which stands in the west in the constellation of Cancer, the crab. In astronomical magnitude it is 0.5, considerably fainter than the minus 2.1 of Jupiter, but still equal to a typical star of the first magnitude.

Speaking of stars, the brightest now seen is Vega, in Lyra, the lyre, over to the northeast. Just below this figure is Cygnus, the swan, with Deneb, also of the first magnitude, though in the position shown it looks fainter because it is so near the horizon. In the southwest, to the left of Cancer, is Leo, the lion, with the star Regulus. And next to Leo, continuing to the left, is Virgo, the virgin,

with Spica. Above the eastern part of Virgo is Bootes, the bear driver, in which Arcturus shines.

## Canis Minor in West

Low in the west, below Cancer, is Canis Minor, the lesser dog, with Procyon. To the right of the dog we see Gemini, the twins, with Castor and Pollux, the latter of magnitude one. Low in the northwest in Auriga, the charioteer, is Capella, a star that shone directly overhead on winter evenings, and now is about to leave our view for a while.

As for the other planets, Mercury is not to be seen at all in May, but Venus, of magnitude minus 3.3, more brilliant even than Jupiter, comes up in the east just before sunrise. Mars is in the same part of the sky, though far fainter, with magnitude 1.5. At the beginning of May, Venus rises first. However, the two planets pass on May 17, and after that Mars is the first to appear. On the morning of May 18, the moon, a narrow crescent two days before it is new, passes Mars and Venus, so the three bodies in the sky will make an interesting spectacle.

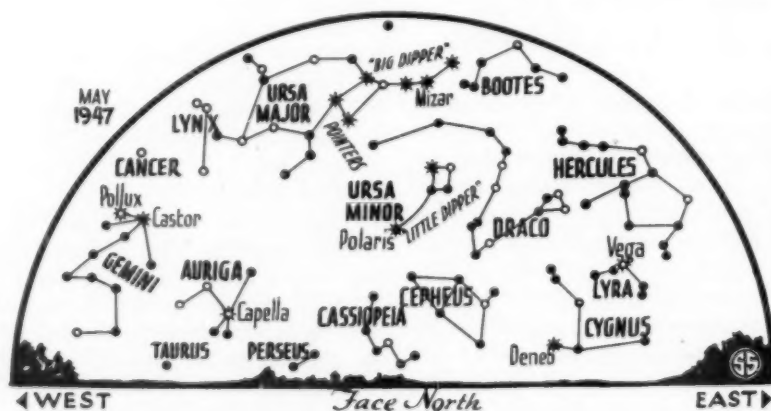
The most important astronomical event of the month—indeed of the year—takes place on May 20 when the shadow of the moon sweeps across the earth for the first time since July, 1945, causing a total eclipse of the sun. That one occurred during wartime. It was quite short, and early in the morning in the parts of the United States and Canada

where it was visible. Though the May 20 eclipse is not visible at all in North America or Europe, it provides a much better opportunity for astronomers to make the observations that are possible only when the moon hides the sun, and so many parties are traveling to the places in South America and Africa where it can be seen. Not all of these are astronomers, for such an eclipse gives physicists an unusual opportunity to study problems of the transmission of radio waves. As the moon cuts off ultraviolet radiation from the sun the ionosphere—the radio “roof” high in the atmosphere that keeps all except the shortest of radio waves from leaving the earth and shooting into outer space—is quickly affected. Thus radio transmissions from and across the path of the shadow will be made and measured.

## Moon's Shadow

At 7:09 a.m., EST, on May 20 the moon's shadow will touch earth at a spot in the Pacific Ocean several hundred miles off the coast of southern Chile. Thence it moves northeastward, tracing out of the path of totality, about 100 miles wide, in which the sun will be completely hidden. As it sweeps across Chile, it goes to the south of Valparaiso, but includes Santiago, where the total phase occurs just after sunrise. It then moves across central Argentina, Paraguay and Brazil, reaching the Atlantic coast at Bahia at 7:45 a.m., EST (though by local standard time it will be 9:45 a.m.).

Going to sea, the shadow quickly crosses the Atlantic, reaching the coast of Liberia, in Africa, about 9:25 a.m., EST, which will be 12:25 p.m. there. It goes along the Gold and Ivory Coasts,



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and heads inland, due east, and then a little southeast. The shadow leaves the earth from a spot in Tanganyika at 10:25 a.m., EST, but there it will be at sunset. Over a much larger area than this narrow path, including all of Africa, much of the South Atlantic and most of South America, there will be a partial eclipse, with the dark disk of the moon hiding more of the sun the nearer one is to the path of totality.

### Long Eclipse

One of the most attractive features of this eclipse, to astronomers, is its relatively long duration. While the sun can be totally eclipsed for as long as  $7\frac{1}{2}$  minutes, it is rarely that one lasts more than a couple of minutes. In the middle of the Atlantic Ocean this eclipse will last for 5 minutes 14 seconds, but as it is hard to make entirely satisfactory observations from a ship this will not be of so much value. In Liberia, however, the duration will be but a few seconds less than five minutes. Along the coast of Brazil it will last about four minutes which is still quite good.

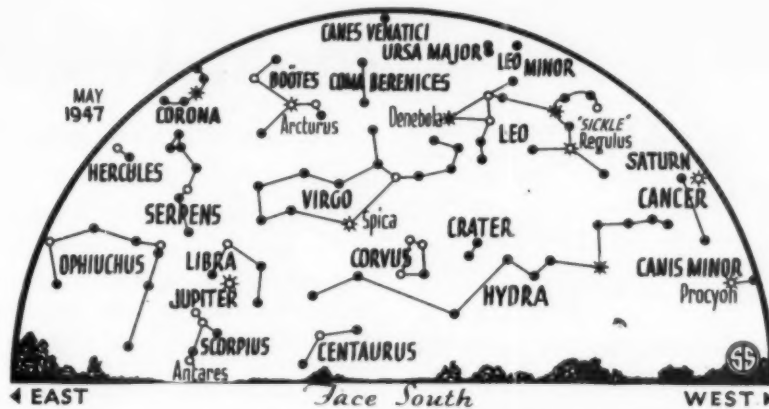
Many expeditions of astronomers have gone from observatories in the United States, Canada and various European countries to favored locations in Brazil and Africa. Photographs will be made with cameras large and small. Some will be made through spectroscopes, to analyze the light of the eclipse. Thus we will gain added knowledge of the sun, particularly of its mysterious corona, the outermost layer. Until a few years ago it was visible only at eclipse time, but there are new techniques by which the brightest parts may be observed at other times. Still, however, to see it in its entirety an eclipse is needed and that is one of the main reasons that makes astronomers travel thousands of miles, gambling with possible cloudy weather, to be there when the moon hides the sun.

### Celestial Time Table for May

May	EST	
4	11:53 p.m.	Full moon
5	7:09 p.m.	Moon passes close to Jupiter
10	2:00 a.m.	Moon farthest, distance 251,600 miles
13	3:08 a.m.	Moon in last quarter
14	3:00 a.m.	Jupiter opposite sun and nearest, distance 407,300,000 miles
17	7:00 a.m.	Venus passes Mars
18	3:46 a.m.	Moon passes Mars
	4:30 a.m.	Moon passes Venus
20	8:44 a.m.	New moon; total eclipse of sun visible in South America and Africa
22	2:00 a.m.	Moon nearest, distance 224,600 miles
24	5:38 p.m.	Moon passes Saturn
26	11:35 p.m.	Moon in first quarter

Subtract one hour for CST, two hours for MST, and three for PST.

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◊ \* \* \* SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

### MINING

## Demonstration of Mine Explosions Are Made

► THE DEMONSTRATION of coal-mine explosions and preventive measures, being given in Bruceton, Pa., by the U. S. Bureau of Mines on Saturday, April 26, is part of an educational program of the government office discontinued during the war but revived a year ago.

The recent Centralia disaster, and the following explosion with several fatalities at Exeter in Pennsylvania, are evidences of the need of such a program. In an industry where explosive gases and organic dusts collect in the air in underground chambers, and in which explosives are necessarily used to loosen seams of coal, every worker concerned, from boss to helper boy, needs instruction in the danger and how they are best lessened.

While this demonstration is open to the public, the program is primarily for mine supervisory officials, foremen and operators. It is being given at the Bureau's experimental mine, with man-made explosions of methane gas and of coal dust. Methods of extinguishing fires, and the testing of safe and unsafe explosives for blasting purposes, will be demonstrated.

For the coal-dust explosion, 700 pounds of the finely pulverized material will be spread in the mine entrance and ignited by a stick of dynamite. Dynamite is not an explosive that may be used in coal mining under the government's safety code, but it is still used in some mines.

The Bureau has tested many explosives used in mining and has designated some that will not cause dust explosions when used. These are designated as "permissible explosives."

The demonstration will show how permissible explosives will not ignite a cloud of dust, as well as the danger of using a nonpermissible.

The Bureau's experimental mine is reported to be the only one of its kind in the world. It was opened in 1911, and the principal work undertaken in connection with it has been the development of ways to prevent gas and dust explosions. Rock-dusting, coating the walls and ceilings of coal mines with pulverized limestone, or other noncombustible material, is one of its great achievements.

Science News Letter, April 26, 1947

### CHEMISTRY

## Rubberlike Compound Can Be Used as Insulation

► A SYNTHETIC rubberlike insulating compound invented by a German, Willi Mertens of Berlin, is the subject of patent 2,418,978, vested in the Attorney General. It is a mixture of polyisobutylene, styrene and paradiethylbenzol, heated until it has become soft and rubbery.

Science News Letter, April 26, 1947

## ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ WYOMING

Yes, even THIS summer you may fish in its mountain streams, ride horseback through its hills and canyons, find Indian relics and marine fossils in a region of great historical and geologic interest.

The Patons welcome a limited number of guests at their ranch in the Big Horn country. They offer plenty of ranch grown food, comfortable cabins and gentle horses. May they tell you more? Write:

**Paton Ranch, Shell, Wyoming**



## Do You Know?

Most plant *seeds* germinate faster, and in some cases better, in soil that is not fertilized.

*Boysenberry* is one of California's principal bushberry crops; it is a variety of the blackberry.

*Yellowstone* had been a U. S. National Park 75 years on March 1, 1947; it is the grandfather of all national parks, the first to be established.

*Mental disorders* affect, in some degree, some 8,000,000 Americans, it is estimated; mental cases fill more than half the hospital beds in the nation.

*Bark* from mangrove trees is used for tannin, and the timber, hard, heavy, tough and durable, for tropical construction.

*Oysters* contain copper, iron and manganese, needed by the human body; also calcium and phosphorus that assist bone growth, and iodine that aids the thyroid gland.



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## CHEMISTRY

# Mold Will Make Alcohol

Molds will take the place of malt, saving grain needed for food and other uses. The mold turns starches into sugars in this method.

➤ **ALCOHOL** for both beverage and industrial purposes will be produced in this country on a major scale without the ages-old malting process, thus saving the grain formerly used in making malt for food and other uses. This revolution in one of the world's oldest industries is being wrought by turning malt's traditional job over to one of the molds sometimes found on old bread.

At the meeting of the American Chemical Society at Atlantic City, N. J., S. L. Adams and associates, chemists for the distilling firm of Seagram and Company, told of improved methods they have worked out for the mass culturing of this valuable mold, and of their company's plans for its use in large-scale alcohol production.

At the Northern Regional Research Laboratory of the Department of Agriculture, in Peoria, Ill., government researchers have developed their own mold-production method. They feed it on a watery waste product of the liquor business known by the unappetizing name of "thin distillery slop," with a little ground corn and ground limestone added. After letting the mold grow on this for a couple of days at a temperature of about 140 degrees Fahrenheit, they pour a few gallons of it into 100 gallons of grain mash. The starch in the mash is soon converted into fermentable sugars, ready for the yeasts to work on.

During the war, another chemist, Leo M. Christensen, then at the University of Nebraska, took out a patent on still another method for producing this valuable mold, in which common bran is the principal nutrient used.

However produced, the mold is able to take over malt's old job because it uses the same chemical tool on starch, to turn it into fermentable sugars. This is a starch-digesting enzyme called amylase. When grain is sprouted, in the making of malt, quantities of amylase are produced to turn the reserve food-stock of starch into sugar, for the benefit of the young plant. Then the sprouting grain is heated just enough to kill it, then

dried and ground up. The amylase, still present, will work on any starch to which it is added, changing it into sugar.

It just happens that this mold produces amylase just as good as that in malt—maybe even a little bit better. The chemists in the Peoria laboratory got a slightly higher yield of alcohol, per bushel of grain, when they used mold than they did when they used malt.

Although mold conversion of starch into sugar for fermentation is the newest thing in modern industrial chemistry, it still has an ancient history. The same mold has been used in the Orient for centuries in making alcoholic beverages out of rice—for example, Japan's famous saké. But in those old lands it has always been employed on a handcraft basis; only now is the Occident giving it a big-time job.

Botanically the mold is known as *Aspergillus niger*. It is a first cousin of *Penicillium notatum*, the mold that produces penicillin, the drug that has revolutionized medicine.

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## CHEMISTRY

# Chemical Makes Safer Wave-Fixer for Hair

➤ **AMMONIUM** thioglycolate, a wave-fixer for hair, is a much safer compound to use than the ammonium hydrogen sulfide that was formerly the standard, Dr. Cornelia T. Snell of New York told the American Chemical Society meeting in Atlantic City, N. J. The older compound was irritating even on unbroken skin, and if it got into a scratch it raised blisters. Ammonium thioglycolate, tested on rabbits, produced relatively little irritation in scratches, and on a whole skin caused no more redness than a good shampoo liquid.

Science News Letter, April 26, 1947

War-famed *Stalingrad*, Russia, is found to be in a natural gas-bearing region; drilling during 1946 found the gas-bearing stratum about a half mile below the surface.

## MEDICINE

# Treatment for Cirrhosis

**Liver extract gives cirrhosis patients new lease on life. Tissues are restored and weight is gained. Return of appetite is first sign of improvement.**

► A NEW TREATMENT for cirrhosis of the liver which seems to give the patients a new lease on life by restoring their appetites is reported by Drs. Daniel H. Labby, Robert E. Shank, Henry G. Kunkel and the late Charles L. Hoagland of the Rockefeller Institute for Medical Research in the *Journal of the American Medical Association* (April 19).

The treatment consists of injections into the veins, two or three times a week, of a crude liver extract. The survival rate at the end of two years in the patients given this treatment was 77% compared with 45% among patients treated by diet and vitamin supplements and 22% to 25% among untreated patients.

All the patients were in what physicians term the "decompensated" stage of cirrhosis. They had either jaundice, hemorrhage, dropsy or fluid on the abdomen or a combination of these conditions. Of the 30 patients 21 were chronic alcoholic addicts.

One of the first signs of improvement in these seriously ill patients was a return of appetite, which in many cases had been practically nonexistent. At the same time they began to feel well and lost the tired feeling that many had complained of. They began to gain weight, wasted tissues being restored. The fluid on the abdomen disappeared in 12 of the 30 and another seven did not have to be tapped to withdraw the fluid nearly as often as before the start of treatment.

"In many instances such physical,

economic and social rehabilitation was accomplished that it was difficult to compare the state of apparent health during the course of treatment with the previous serious clinical state," the physicians report.

Five patients who had been treated from 10 to 18 months have been able to get along without treatment for from four to 15 months without relapsing.

The patients were required to abstain from alcohol but were not on a special diet. They were advised to eat foods high in protein, such as meat, cheese and eggs, and rich in starch and sugar. Vitamins were not given, except for short terms of vitamin B treatment for those with symptoms of a lack of this vitamin.

The increased appetite with consequent increase in food eaten and in weight gained and in vigor is believed the chief factor responsible for the patients' improvement.

The liver extract may also encourage rebuilding of the liver tissue and help restore to normal the various chemical processes that have gone wrong in the patient with cirrhosis. Further study is needed to show whether this is the case.

*Science News Letter, April 26, 1947*

## CHEMISTRY

## Light Energy Makes Rubber From Petroleum Compounds

► GREEN PLANTS still monopolize the secret of using sunlight to change carbon dioxide and water into food stuffs, but man seems on the threshold of performing a parallel chemical miracle by utilizing light to turn petroleum compounds into synthetic rubber. At the meeting of the American Chemical Society in Atlantic City, N. J., Prof. Keith J. Laidler of the Catholic University of America told of first steps in this direction, taken with the aid of metallic vapors that carry the energy of light to make the transformation.

The task which the light-energy is given to perform is the removal of hy-

drogen from the hydrocarbon molecules. If single hydrogen atoms are knocked out, free hydrocarbon groups remain that may combine into chemically useful long chains, or polymers. If the atomic twins that constitute hydrogen molecules are loosened, chemically active and industrially useful compounds known as olefins are formed.

The metals which Prof. Laidler has found most effective in his photochemical syntheses when used in vaporized form are zinc, cadmium and mercury. Nature of the reactions is strongly influenced by the color of the light used.

*Science News Letter, April 26, 1947*

## ANTHROPOLOGY

## Life Ended Below Forty In Turkey of Ancient Times

► LIFE DIDN'T begin at forty in ancient Turkey; as a rule, it ended then, or even earlier.

Dr. M. S. Senyurek of the University of Ankara, examining a collection of the skeletons of 120 Turks who lived between 1000 and 5200 years ago, found that three-fourths of these individuals had died before they reached their fortieth birthdays. Only seven got to be as old as 60.

Of those who lived beyond their thirteenth birthdays, the average age at death was 35 for men, 28 for women. The lower death-age for women is attributed to the hazards of childbirth.

Death rate was high among children: 25 of the group did not live to be 12 years old. Dr. Senyurek feels sure, too, that if skeletons of very young children had been preserved they would have indicated an even higher child death rate.

Details of the study are presented in the *American Journal of Physical Anthropology* (March).

*Science News Letter, April 26, 1947*

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### Whence May Flowers?

➤ PERENNIALY, as sure as it rains in the spring, we hear the chirping reassurance: "April showers bring forth May flowers!" This is true in a way, but in a larger way it isn't.

It is true that the warm rains of April trigger the explosion of bloom that comes in May. They provide moisture to fill the rapidly expanding leaves and stems and flower-buds, and the warmth speeds up the growth. But it could be possible for flowers to bloom in May if not a drop of rain fell in April—though that latter contingency is hardly imaginable in most places. If there were deep snows and a slow thaw in March, and a bit of rain as May came in, the flower show would still go on.

For the flowers are all there long before April showers evoke them. Packed away as fairly well-developed, though small, beginnings in bulbs, corms, rootstocks, tubers are the leaves and stems and

flowers that will unfold as the rising warmth stimulates them and as they greedily suck moisture through the roots into their expanding cells. You can prove this for yourself, if you like, by sacrificing a hyacinth or tulip bulb, splitting it fairly down the middle and searching for the tightly-packed flower primordia within the innermost scale.

In most spring-blossoming plants, the flowers and new leaves that gladden our eyes in May are actually formed and put in winter storage some time during the preceding year. This is certainly true of flowers on woody plants, such as lilacs, magnolias and tulip-trees, in which next year's buds begin to form even as this spring's buds begin to unfold. It is true also of the perennial herbs that

depend on underground storage organs which are stocked with food, principally starches and sugars, during the post flowering time in late spring and summer.

But is not merely the forming and stocking of what are to be next spring's flowers that predetermine the beauty we are to see in May. Winter helps, too. A very large proportion of our best spring flowers will not unfold unless they get a thorough chilling after the buds are formed. This is true of such familiar and favorite flowers as dogtooth violet, trillium, spring-beauty, lily-of-the-valley, lilac, weigelia and many others. April showers may bring forth May flowers, but December freezes must come first.

*Science News Letter, April 26, 1947*

### MINERALOGY

## Tektites Are Moon Chips

➤ STONES from the moon are in a number of American museums and private mineralogical collections, if the hypothesis advanced by H. H. Nininger, director of the American Meteorite Museum in Winslow, Ariz., is valid. He holds that the puzzling stones called tektites, found in several parts of the earth, are really chips off the surface of our satellite, blasted loose by the impact of large meteorites coming in at super-V-2 rocket speeds.

Tektites are glass-like stones, usually of rounded shape as if formed from blobs of molten stuff spinning through space. Many of them bear on their surfaces signs of a secondary melting, which Mr. Nininger thinks may have occurred when they struck the earth's atmosphere and suffered somewhat from the friction that erodes away most meteorites as "shooting stars" before they reach the ground. Coming the relatively short distance from the moon, he explains, they would not have full meteorite velocities, hence would undergo much less frictional losses.

Getting them off the moon offers no great difficulty to Mr. Nininger's hypothesis. The moon, like the earth, is the target of constant bombardment by meteorites. Only, having no atmosphere to shield it, the moon takes the full impact of all that come its way. Really big ones hit so hard that they are gasified, with terrific explosions. A major explosion of this kind would spin a shower of fragments of the moon's own rocky material far up into space, and at

the same time the heat would melt it to something like liquid glass. These blobs would soon cool into rounded, glassy pebbles—tektites.

Most of the explosion-shower debris would of course fall back on the moon, but some pieces would be thrown out at high enough velocities to escape the moon's weak gravitational field—only one-sixth that of the earth. Part of these would drift into space and become a part of "chaos and old night", but others would get caught by the earth's gravitational field and fall as quasi-meteorite showers.

There are other theories of the origin of Tektites—volcanic birth, explosion-showers from meteorites striking the earth, etc.—but Mr. Nininger has answers for them, and believes that his hypothesis has a greater chance of being correct.

*Science News Letter, April 26, 1947*

### CHEMISTRY

## Chlorinated Hydrocarbons Kill Bacteria in Water

➤ OBJECTIONABLE bacteria and algae in water supplies can be killed with chlorinated lower hydrocarbons, for example trichlorobutane, trichlorohexane, etc., instead of straight chlorine, which is itself often objectionable, states Charles W. Harnden of Berkeley, Calif. Patent 2,419,021, which he has obtained on this discovery, is assigned to the Shell Development Company.

*Science News Letter, April 26, 1947*

## YOUR HAIR AND ITS CARE

By O. L. Levin, M. D. and H. T. Behrman, M. D.

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# Books of the Week

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**BLUE WATER NAVIGATION**—Svend T. Simonsen—*Cornell Maritime*, 198 p., illus., \$3.50. Originally prepared to teach those engaged in amphibious operations during the war, this text can also be used for home study; no other books are required as necessary pages from Nautical Almanac are included.

**BUILDING SKIN BEAUTY**—Mary MacFadyen—*Emerson*, 30 p., illus., paper, 25 cents. An easy-to-follow guide to skin care.

**CHILD CARE AND TRAINING**—Marion L. Faegre and John E. Anderson—*Univ. of Minn.*, 7th ed. rev., 310 p., illus., \$3.25. Continuing to serve as parents' guide, discussion group handbook, and college text, this useful book is up-to-date.

**CHIPS FROM THE BLASTED MOON**—H. H. Nininger—*Desert Press*, 34 p., illus., paper, 25 cents. Hypotheses on the lunar origin of tektites are outlined. Tektites are glass-like stones of rounded shape bearing no relation to the geological strata in which they are found.

**CITIES OF AMERICA**—George Session Perry—*McGraw-Hill*, 287 p., illus., \$3.50. The history of our country is well defined in the character and traditions of her cities; 22 are analyzed here, representing every section of the U.S.

**CLIMATE AND THE ENERGY OF NATIONS**—S. F. Markham—*Oxford Univ. Press*, 2nd ed. rev., 240 p., \$4.50. An interesting analysis of the effects of temperature on history and postulations as to the future use of air conditioning to stimulate activity.

**COAL CHEMICAL INDUSTRY: Trends and Problems**—P. J. Wilson, Jr. and J. H. Wells—*Mellon Inst.*, 5 p., illus., paper, free. The technical and engineering problems and the progress made by this industry are presented.

**ECONOMIC RESEARCH AND THE DEVELOPMENT OF ECONOMIC SCIENCE AND PUBLIC POLICY**, *Nat. Bur. of Economic Research*, 198 p., \$1. Twelve papers presented at the twenty-fifth anniversary meeting discuss problems toward which research should be directed.

**ELECTRONICS: What Everyone Should Know**—Calvin and Charlotte Mooers—*Bobbs-Merrill*, 231 p., illus., \$2.75. How electrons are put to work for home and industry and what they may be expected to do in the future is capably explained in this non-technical book for "everyone".

**EXPLAINING THE ATOM**—Selig Hecht—*Viking*, 205 p., \$2.75. Written by one who did not work on the atom bomb, with information from public sources, this book's purpose is to supply a background for thought and action in connection with the legislation on questions of atomic energy.

**FISHES OF THE PACIFIC COAST OF CANADA**—W. A. Clemens and G. V. Wilby—*Fisheries Research Board of Canada, Bulletin No. LXVIII*, 368 p., illus., paper \$1.68, cloth \$2.18. About the marine fishes of this region; a point-of-departure for further detailed study of distribution and life histories.

**MODERN WOMAN: THE LOST SEX**—Ferdinand Lundberg and Marynia F. Farnham—*Harper*, 497 p., \$3.50. A readable descrip-

tion of the causes and cures of unhappiness and neurosis, especially in women, together with a discussion of the social implications. It is based on experience with women patients in a psychiatrist's consulting room.

**MOLD AND MILDEW CONTROL**—S. S. Block—*Florida Engineering and Industrial Experiment Station*, 50 p., illus., paper, free. An attempt to correlate information now available from Army investigations has resulted in this booklet useful to all who live in warm moist climates.

**ON UNDERSTANDING SCIENCE; AN HISTORICAL APPROACH**—James B. Conant—*Yale Univ. Press*, 145 p., \$2. Some of the great minds of the past, their concepts of science, analyses and solutions of problems are introduced to the reader by the president of Harvard University under the auspices of the Terry Foundation.

**PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY**—Luther P. Eisenhart, ed.—*Publ. by the Society*, Vol. 91, No. 2, 91 p., paper, \$1. Eight papers include a discussion of atomic physics and international cooperation, an electronic reading aid for the blind, race relations, medicine in the USSR and photographic meteor studies.

**PROCEEDINGS OF THE INDIANA ACADEMY OF SCIENCE**, Vol. 55, *State Library*, 217 p., \$3. Papers include anthropology, bacteriology, botany, chemistry, geology and geography, history, mathematics, physics, psychology, and zoology; many are abstracts only.

**THE RARE-EARTH ELEMENTS AND THEIR COMPOUNDS**—D. M. Yost, H. Russell, Jr., and C. S. Garner—*Wiley*, 92 p., \$2.50. A timely discussion of these elements, now increasingly important with present concepts of atomic structure.

**THE STORY OF THE UKRAINE**—Clarence A. Manning—*Philosophical Lib.*, 326 p., \$3.75. The history of a thousand years of struggles of a people to maintain their language and traditions.

**THE STRUGGLE FOR ATOMIC CONTROL**—William T. R. Fox—*Public Affairs Committee*, 32 p., paper, 20 cents. A discussion of today's important and absorbing world problem.

**THE SUN'S SHORT REGULAR VARIATION AND ITS LARGE EFFECT ON TERRESTRIAL TEMPERATURES**—C. G. Abbot—*Smithsonian Institution, Misc. Col. Vol. 107 No. 4*, Pub. No. 3893, 33 p., paper, 30 cents. This regular average periodicity, which appears to be a new discovery, is not to be confused with temporary weather periods.

**THE TALKING WIRE**; The Story of Alexander Graham Bell—O. J. Stevenson—*Messner*, 207 p., illus., \$2.50. A revealing biography for teenagers of the man who made the first telephone.

**TROPICAL AND SUBTROPICAL FRUITS**—B. E. Dahlgren—*Chicago Natural History Museum*, 72 p., illus., paper, 50 cents. In this interesting booklet, the fruits are discussed in groupings of those of Old World and those of New World origin.

**WORLD WEATHER RECORDS, 1931-1940**—H. Helm and Frances L. Clayton—*Smith-*

*sonian Institution, Misc. Col. Vol. 105*, Pub. No. 3803, 646 p., paper, \$3.50. This comprehensive volume was prepared in cooperation with the various official weather services and observatories of the world.

**YOU ARE BORN TO VICTORY**—John Glosinger—*Duell*, 115 p., \$2. Mottoes for living by the author.

**YOUR CALIFORNIA GARDEN AND MINE**—Sydney B. Mitchell—*Barrows*, 261 p., illus., \$3. Practical views of the writer on ornamental planting are especially valuable to those gardening in California.

*Science News Letter, April 26, 1947*

## CHEMISTRY

### Metallic Sodium Makes Lead Sheathing Last Longer

➤ **LEAD SHEATHING** on electric cables and similar exposed installations can be made to last much longer by alloying it with metallic sodium, reported Drs. B. B. Reinitz and N. A. Zamborsky of the Okonite-Callender Cable Company to the American Chemical Society meeting in Atlantic City, N. J. They told of cables so protected that have been in use for 10 years with no sign of age hardening, corrosion or other abnormal condition.

*Science News Letter, April 26, 1947*

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❁ **TOY** motor boat, of aluminum, is powered by a tiny outboard motor operated by two flashlight batteries. The electric motor is of "fleapower" size, and was developed during the war for use in the radio-electronics field.

Science News Letter, April 26, 1947

❁ **WATER VAPOR** indicator, developed especially for inspecting the breathing oxygen supply for aviators, can be applied to gases in general. The relatively simple instrument, which requires no special skill to operate, uses only a small sample of the gas.

Science News Letter, April 26, 1947

❁ **WEIGHING MACHINE**, for factory use in quick weighing for packaging dry products from peanuts to tacks, works on the buoyancy principle. Weighing trays are mounted on vertical cylindrical floats in a liquid. When the added weight sinks a float the proper amount, its tray is automatically tripped.

Science News Letter, April 26, 1947

❁ **SILICONE** product, which eliminates the need of lard or other greases in bread baking pans, is sprayed and baked onto the pans; one application is good for 200 bakings. The coating prevents the bread from sticking to the pans and gives more evenly browned



loaves. As yet, it is available only for commercial bakeries.

Science News Letter, April 26, 1947

❁ **HEATPROOF** paint, that will prevent hot metals from corroding and scaling at temperatures as high as 1850 degrees Fahrenheit, is claimed to protect metals under all weather conditions. Its uses range from furnace pipes to mufflers on trucks and tractors.

Science News Letter, April 26, 1947

❁ **PLASTIC TABLEWARE**, complete with plates, cups, saucers, bowls and platters, is designed for heavy duty because the dishes are practically unbreakable under ordinary use. Made in various colors, the plastic articles resemble usual tableware, are tasteless, resistant to fruit juices, and not injured by boiling water.

Science News Letter, April 26, 1947

❁ **PLASTIC** funnel for filling bottles is in reality two separate funnels, one much larger than the other, that can be used separately or in combination. When combined, the top of the smaller funnel, which has a half-inch spout, fits tightly over the two-inch spout of the larger funnel, making an ideal funnel for pouring large volumes of liquid into small-mouthed bottles.

Science News Letter, April 26, 1947

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